Binary Output 23BA40

Application

The binary output board 23BA40 can be used for the potentially isolated output of up to 16 binary signals to the process. The allocation of an output signal to the processing functions can be done according to the rules of configuration.
The 23BA40 can be used for the following types of signals:

- Object commands with 1- or 2 - pole output without (1 out of n) check
- Regulation Commands
- Digital setpoints
- Bitstring Output, 1, 2 or 16 bit (see note)

The board is available in one version (rubric):

23BA40 R0011	for 24 up to 220 V DC and up to 250 V AC

Note: The number of simultaneous active relays may not exceed **8** at heavy conditions (220 V DC, 8 A, at 70 °C/ 158 F).

Power supply 560PSU40/41 is needed to feed these modules.

Characteristics

The binary output is made via relay contacts. Resistive loads of up to 120 W can be switched with output voltages between 24 and 220 V DC. The process relays to be switched have to be equipped with zero voltage diodes.

The 16 are potentially isolated from one another as well as from other logic. If a common return is necessary, it can be realized by two external short circuit connectors, which are included in the delivery.

Two output relays of the board 23BA40 are required for each command in the case of two- pole commands (e.g. c01 together with c09).

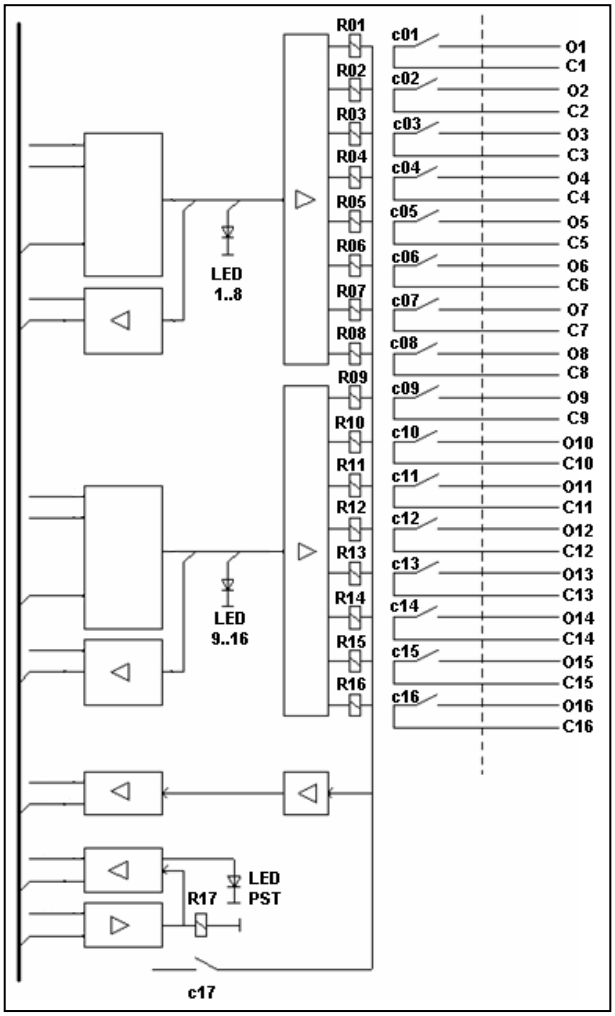

Figure 1: Function block diagram Binary output board 23BA40

The binary output board 23BA40 can execute the following processing functions on the individual signal types:

- Control of the command output duration following instruction from the communication unit (CMU)

Before and during command output the board 23BA40 carries out several monitoring functions:

- (m out of 16) check of the output relays on the board 23BA40
- monitoring of the output bit patterns by re-reading
- switching voltage monitoring before and during output
- command output duration monitoring

If a fault occurs during running of tests the command will be cancelled. The switching through of the output relays by the release relay c17 occurs only following successful testing.

A defective driver stage or a fault in the release relay R17 leads to complete inhibition of the 23BA40 board.

Operating states and faults are displayed by light emitting diodes on the top of the 23BA40:

- 5V: indicates that 5 V power is applied to the 23BA40
- ST: Common malfunction information of the board
- PST: Command output fault condition display when the monitoring system responds
- 1...16: Display the active output relays

The board micro-controller is responsible for interactive communication with the RTU560 system bus. All configuration characteristics and processing parameters are downloaded from the communication unit via the RTU system bus. Only the setting of the device- and rack address is required on the board.

The board is equipped with a serial interface to the RTU560 system bus.

During initialization and operation the board carries out a number of tests. If a fault occurs it is reported to the communication unit. All fault conditions impairing the function of the board are displayed as common fault signal with a light emitting diode (ST) on the top panel. A failure of the board is detected by the communication unit.

Technical Data

In addition to the RTU560 general technical data, the following applies:

Output Circuits

Outputs	16 relay contacts, single pole

Relay Characteristics:

Max. switching voltage	220 V DC (+15 %) 250 V AC (max. 8 A)
Max. switching current (at L/R = 40 ms)	300 mA @ 110 V DC 200 mA @ 220 V DC
Max. switching capacity, resistive load	120 W
Inductive load, @ L/R = 40 ms	50 W
Continuous current of a relay	Max. 8 A 60 A for 0.5 sec
Switching frequency	Max. 3 Hz
Number of simultaneous active relays	Max. 8 (200V DC, 8A, 70 ºC)

Power Supply

Power Supply	24 V DC ± 10 %
Current consumption	Typ. 25 mA, additional 10 mA per active relay

Mechanical Layout

Housing	for EN-Rail mounting
Color Housing	green
Top cover	light grey
Dimension	180 x 126 x 61 mm
Weight	465 g without connectors

Connection Type

Process connector	16-pole pluggable screw-terminal, Phoenix Contact, MVSTBR 2.5/16-STF-5.08 (2 included in delivery)
Common return	Short circuit connectors (2 included in delivery)
Power supply and E-line Serial peripheral bus	3-pole pluggable screw-terminal, Phoenix Contact, MVSTBR 2.5/3-ST-5.08 (2 included in delivery)

Insulation

Transient voltage according to EN60255-5, 12/2001, chapter 6.1.3, respectively EN60870-2-1, 07/1997, chapter 6, class VW3	5 kV DC, 1.2µs/50µs
Withstand voltage according to EN60255-5, 12/2001, chapter 6.1.4, respectively EN60870-2-1, 07/1997, chapter 6, class VW3	2,5 kV AC 50 Hz
Insulation resistance according to EN60255-5, 12/2001, chapter 6.2.2	>100 MΩ at 500 V DC

Electromagnetic Compatibility

Electrostatic discharge immunity test according EN61000-4-2, 12/2001, (level 3)	6 kV Conducted 8 kV Air Performance criteria A
Radiated radio-frequency electromagnetic field immunity test according to EN61000-4-3, 11/2003, (level 3)	10 V/m Performance criteria A
Electrical fast transient/burst immunity test according to EN61000-4-4, 07/2005 (level 3)	4 kV Performance criteria A
Surge immunity test according to EN61000-4-5, 12/2001, (level 3)	2 kV (line to line) 4 kV (line to earth) Performance criteria A
Immunity to conducted disturbances, inducted by radio-frequency fields according to EN61000-4-6, 12/2001 (level 3)	10 V Performance criteria A
Oscillatory wave immunity test according to EN61000-4-12, 12/2001 (level 3)	2,5 kV (Common Mode) 1 kV (Differential Mode) Performance criteria A
Test for immunity to conducted, common mode disturbances according to EN61000-4-16, 04/2005 (level 4)	0 Hz to 150 kHz 30 / 300 V Performance criteria A

Test for immunity to voltage dips/short interruptions according to EN61000-4-29, 10/2001	-100 %: 50 ms Performance criteria A

Interference

Electromagnetic disturbance characteristics according to EN55011, 08/2003 0.01 to 30 MHz	≤ 66 µV Class A
Electromagnetic disturbance characteristics according to EN55011, 08/2003 30 MHz to 1 GHz	≤ 50 µV/m Class A

Safety

Information Technology Equipment according to EN60950-1, 03/2003	Over voltage category II, pollution degree II, reinforced insulation

Mechanical Stress

Vibration tests (sinusoidal) according to IEC60255-21-1, 05/1996, chapter 4.2, class 1	0.0350 mm 0.5 g at 10 … 150 Hz
Mechanical influences (sinusoidal) according to IEC60870-2-2, 06/1998, chapter 4.2, class B	10 m/s^2 at 9 … 200 Hz 15 m/s^2 at 200..500 Hz
Vibration, shock, bump and seismic tests according to IEC60255-21-2, 05/1996, chapter 4.2, class 1	15 g, 25 g / 11 ms 6 impulse / ordinate 10 g / 16 ms 1000 impulse / ordinate
Seismic test	3.5 mm / 1 g / 1…9 Hz 9…35 Hz

Environmental Conditions

Temperature	-25 … 70 ºC
Relative humidity	5 … 95 % (not condensing)

Ordering information

23BA40 R0011	1KGT 011200 R0011

Accessories

Power Supply Unit 560PSU40/41	For up to 8 units
Ordering number 560PSU40	1KGT 011600 R0001
Ordering number 560PSU41	1KGT 017700 R0001
Fiber optic coupler 560FOC40	
Ordering number 560FOC40	1KGT 011500 R0001

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